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ZARETSKY & ASSOCIATES PC
8753 W. RUNION DR.
PEORIA, AZ 85382-6412

EXAMINER	
MCLOUGHLIN, MICHAEL I	

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2662	8

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/679,330	MUSHKIN ET AL.	
	Examiner	Art Unit	
	Michael I McLoughlin	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-47* is/are pending in the application.

4a) Of the above claim(s) *12-15* is/are withdrawn from consideration.

5)☒ Claim(s) *23-26,28,29,32 and 33* is/are allowed.

6)☒ Claim(s) *1-11,16-22,27,30 and 34-47* is/are rejected.

7)☒ Claim(s) *31* is/are objected to.

8)☒ Claim(s) *1-47* are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 January 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *3 and 6*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121.

I. Claims 1-11, and 16-47, drawn to mutual (reciprocal) synchronization, classified in class 370, subclass 507.

II. Claims 12-15, drawn to carrier sense multiple access (CSMA), classified in class 370, subclass 445.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as synchronizing devices on a network may not include the media capture of invention II. Also, invention II has separate utility such as managing devices on a shared media, and may not require the synchronization signal of invention I. See MPEP § 806.05(d).

3. During a telephone conversation with Howard Zaretsky on December 30, 2003 a provisional election was made without traverse to prosecute the invention I, on claims 1-11, and 16-47. Affirmation of this election must be made by applicant in replying to this Office action. Claims 12-15 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the

application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Drawings

5. Figures 1A, 1B, 1C, and 1D should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

- In line 29 of page1 there appears to be a typographical error and "able to communication with each" probably should be -able to communicate with each-.
- In line 12 of page 15 there appears to be a typographical error and "collision resistance" should be -collision resistant-.
- In line 26 of page 15 there appears to be an error

Appropriate correction is required.

Claim Objections

7. Claims 1 and 37 are objected to because of the following informalities: The use of "synchronization pulses" in line 13 in addition to "synchronization signals' would indicate that these are two different limitations. It is not clear whether or not this is the case.

8. Claims 1, 16, 21, 34, and 37 are objected to because of the following informalities: The limitation "transmitting ....on a random basis at specific points in time" is a confusing phrase for random and specific are contradictory terms. Examiner suggests that periodic or

predetermined could be used instead of random since Examiner understands that this basis means a duty cycle as specified in lines 26-27 on page 16 in the specification.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 1-11, 21, 27, 30, 37, 39, 44, and 46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The specific subject matter rejected in these claims are as follows:

1) The specification inadequately defines how one would enable "Maintaining synchronization ...when the synchronization signal is not transmitted" in lines 10-11 of claims 1, 21, and 37.

2) The specification inadequately defines how one would enable communication between nodes if "each node is adapted to transmit a different bi-phase sequence" in claims 5, 27, and 44.

3) The specification inadequately defines how one would enable "selecting a number at random and deciding to transmit said synchronization signal if the number selected is greater than a predetermined amount chosen in accordance with a desired duty cycle" in lines 2-4 of claims 8, 30, and 46. It appears that lines 22-28 of page 16 in the specification are intended to define these claims, but are written in a way that does not

provide a clear understanding. This is especially true of lines 25-27, and the threshold 50/50.

4) The specification inadequately defines how one would enable a node for "deriving timing from synchronization signals from other nodes" with "each node inserting a synchronization signal" in claim 39.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 8, 18, 30, and 46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

13. Claims 8, 30, and 46 has two issues as follows:

- "selecting a number... and deciding to transmit...if the number is greater than a predetermined amount" renders the claims indefinite for it is not known how one can compare a number to an amount. Also, there is no definition of an "amount" in the specification.
- "chosen in accordance with a desired duty cycle" renders the claims indefinite for the meaning of "accordance" is not known. How is this factor chosen in relationship to the desired duty cycle?

14. Claim 18 recites the limitation "said an application processor" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

16. Claims 1, 2, 10, and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Wilson et al. (U.S. 5,974,056), hereinafter referred to as Wilson.

17. Regarding claim 1, Wilson discloses a method of synchronization between a plurality of nodes connected to a media, each node including a clock (plurality of stations A-K on media 2 in figure 1, each node a including clock 7' as shown in figure 2). The method comprises the steps of:

listening to the media for a predetermined length of time while attempting to detect synchronization signals from other nodes (individual stations wait a certain time period to see if another start packet of a frame occurs where the time period corresponds to an integer multiple of the duration of a frame, see lines 18-22 in column 4, to detect a start packet that is employed by all stations as a synchronizing signal, see lines 62-66 in column 1);

if synchronization signals are detected, deriving a timing signal from synchronization signals (if the start packet is detected using this as the basis for the respective station clock and to derive timing for the respective station, see lines 60-66 in column 1);

aligning the clock in a particular node in accordance with the timing signal (synchronizing the individual stations with a fixed phase relationship via start packets that is

synchronized anew with each transmission, see lines 14-20 in column 2, and adjusting the clock and clock pulse frequency based on the actual arrival time of a start packet, see lines 41-46 in column 2); transmitting synchronization signals into the media at specific points in time (transmitting the start packet with a specified repeat frequency, see lines 53-54 in column 1);

listening to the media when the synchronization signal is not transmitted and attempting to detect synchronization signals transmitted by other nodes (noticing an absence of a start packet, see lines 13-14 in column 4 and attempting to detect start packets from other stations see lines 5-44 in column 4); and

if synchronization signals are not detected, transmitting synchronization pulses onto the media at particular points in time and waiting for other nodes to join the network (each station which notices that a frame is absent sends a start packet to the medium, see lines 23-25 in column 4 with a specified repeat frequency see lines 53-54 in column 1 and waiting for other stations to accept it as the new master see lines 42-44 in column 4).

18. Regarding claim 2, Wilson further that the step of listening is performed at least upon wake-up of a node (select a master station at the beginning of the operation based on communication among the individual stations, see lines 8-11 in column 2 and at the beginning of each frame the individual stations are synchronized anew, see lines 18-19 in column 2).

19. Regarding claim 10, Wilson further discloses that the synchronization signals, when they are to be transmitted, are transmitted onto the media at the same cyclical point in time (transmits with a specified repeat frequency to the media a start packet defining the beginning of a frame, see lines 53-55 in column 1).

20. Regarding claim 11, Wilson further discloses that the synchronization signals, when they are to be transmitted, are transmitted onto the media at the same cyclical point in time before the body of a frame is transmitted (referring to figure 3, the start packet 19 is transmitted in each frame 20 with a specified repeat frequency where the start packet is before the body of each frame 20).

Claim Rejections - 35 USC § 103

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

22. Claims 3-6, 8, 9, 16-22, and 34-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson in view of Yonge, III et al. (U.S. 6,667,284), hereinafter referred to as Yonge.

23. Regarding claim 3, Wilson teaches the method according to claim 1, but fails to teach that the synchronization signal comprises a sequence of tone pulses since Wilson's media is a bus that uses digital pulses where the claimed invention uses analog tones. Yonge teaches a synchronization signal comprised of a sequence of single tone pulses, each pulse having a different frequency (tone mask 252 as shown in figure 14 and disclosed in lines 62-67 in column 17 that is a set of different frequencies that are verified to be specific frequencies with the Valid Tone Flag 252 in lines 31-32 in column 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include

tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media.

24. Regarding claim 4, Wilson fails to teach that the synchronization signal comprises a wide band bi-phase sequence. Yonge teaches synchronization signal comprised of a wide band bi-phase sequence (the modulation type may be Binary Phase Shift Keying, see line 48 in column 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media with Binary Phase Shift Keying.

25. Regarding claim 5, Wilson fails to teach that each node is adapted to transmit a different bi-phase sequence. Yonge teaches that each node is adapted to transmit a different bi-phase sequence (each node has a local station tone mask 252, see lines 59-67 in column 17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media and to segment the media with the different bi-phase sequences.

26. Regarding claim 6, Wilson fails to teach a wide band bi-phase sequence that is adapted to have good autocorrelation properties. Yonge teaches that the wide band bi-phase sequence is adapted to have good autocorrelation properties (a channel estimation process with 40 symbols for optimum modulation is discloses in line 58 in column 16 through line15 in column 17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have

been motivated to make this modification in order to expand its use to include analog media to segment the media with the different bi-phase sequences while optimizing modulation.

27. Regarding claim 8, Examiner needs resolution of the 35 USC § 112 first and second paragraph issues cited above in order to interpret this claim and consider its merits.

28. Regarding claim 9, Wilson fails to teach a 50% duty cycle. Yonge teaches a duty cycle of approximately 50% (Binary Phase Shift Keying with 1/2 rate coding in lines 48-49 in column 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method to use analog tones with a 50% duty cycle as taught by Yonge, and one would have been motivated to make this modification in order to use standard low cost components that have wide availability.

29. Regarding claim 16, Wilson teaches a media access controller for controlling access by a node to a media connected thereto (see figures 1 and 2, and specifically the bus switch 5 in figure 2 that controls the TX/RX access), comprising:

a synchronization signal generator adapted to generate a synchronization signal and subsequently transmit the synchronization signal onto the media during a predetermined synchronization time slot (referring to figure 3, the Manchester encoder 6 inherently is a synchronization signal generator adapted to generate and subsequently transmit a start packet 19 during the predetermined first time slot 21 of each frame 20);

a synchronization mechanism adapted to achieve synchronization between a particular node and other nodes, the synchronization mechanism operative to control the generation of the synchronization signal by the synchronization signal generator (a synchronization mechanism

that uses the start packet to synchronize the stations of figure 1 throughout the summary of the invention);

a timing mechanism operative to produce a timing signal derived from a plurality of received synchronization signals (deriving timing from the start packets which are used as a synchronization signals in lines 62-66 in column 1);

However, Wilson fails to teach an occupation signal, or a MAC associated with the occupation signal.

Yonge teaches a frame occupation signal generator adapted to generate a frame occupation signal when the node obtains access to the media; and a media access controller for coordinating access to the media (MAC unit 18 as shown in figure 1 provides for contention-free media access and control as taught in 21-23 in column 11 where the access control includes a VSC mechanism that has a value that is set to indicate that the media is busy as taught in lines 21-29 in column 19 and it is inherent that MAC unit 18 include a generator adapted to generate this VCS busy signal), and access to the media is not permitted as long as the presence of a frame occupation signal is detected on the media (if the VCS value is non-zero the medium is busy and the transmitter waits until value is zero or not busy, see lines 26-30 in column 27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's media access controller to add a busy signal as taught by. One would have been motivated to make this modification to extend the use of Wilson's controller beyond proprietary networks and allow its use on the widespread CSMA networks.

30. Regarding claim 17, Wilson teaches the controller according to claim 16, and further teaches the controller comprises a transmit/receive interface adapted to interface the media

access controller to transmit circuitry and receive circuitry (TX/RX driver adapted to interface bus switch 5 as shown in figure 2).

31. Regarding claim 18, Wilson teaches the controller according to claim 16, and further teaches the controller comprising a transmit/receive controller adapted to manage the transmission and reception of data between the an application processor and transmit circuitry and receive circuitry (DSP 7 operated in conjunction with application instructions in memory 10 used to control the bus switch 5 and transmit/receive functions in TX/RX driver 4 as shown in figure 2).

32. Regarding claim 19, Wilson teaches the controller according to claim 16, and further teaches that the timing mechanism is adapted to average the timing of a plurality of individual synchronization signals transmitted by other nodes (clock 7' which adjusts the station timing of the stations when it receives a start packet 19).

33. Regarding claim 20, Wilson teaches the controller according to claim 19, and further teaches averaging is achieved by time averaging the output of a matched filter adapted to a synchronization signal (referring to figure 2, the Manchester decoder in conjunction with the IFL receives and filters start packets that are used as synchronization signals and allows DSP 7 via interface bus 17 to recognize delays or early reception of start packets and adjust the clock rate as needed, see lines 51-54 in column 2).

34. Regarding claim 21, Wilson teaches the controller according to claim 16, and further teaches that the synchronization mechanism comprises processing means operative to:

listen to the media for a predetermined length of time while attempting to detect synchronization signals from other nodes (individual stations wait a certain time period to see if

another start packet of a frame occurs where the time period corresponds to an integer multiple of the duration of a frame, see lines 18-22 in column 4, to detect a start packet that is employed by all stations as a synchronizing signal, see lines 62-66 in column 1);

if synchronization signals are detected, derive a timing signal from the synchronization signals (if the start packet is detected using this as the basis for the respective station clock and to derive timing for the respective station, see lines 60-66 in column 1);

align the clock in a particular node in accordance with the timing signal (synchronizing the individual stations with a fixed phase relationship via start packets that is synchronized anew with each transmission, see lines 14-20 in column 2, and adjusting the clock and clock pulse frequency based on the actual arrival time of a start packet, see lines 41-46 in column 2);

transmit synchronization signals into the media at specific points in time (transmitting the start packet with a specified repeat frequency, see lines 53-54 in column 1);

listening to the media when the synchronization signal is not transmitted and attempting to detect synchronization signals transmitted by other nodes (noticing an absence of a start packet, see lines 13-14 in column 4 and attempting to detect start packets from other stations see lines 5-44 in column 4); and

if synchronization signals are not detected, transmit synchronization pulses onto the media at particular points in time and waiting for other nodes to join the network (each station which notices that a frame is absent sends a start packet to the medium, see lines 23-25 in column 4 with a specified repeat frequency and waiting for other stations to accept it as the new master see lines 42-44 in column 4).

35. Regarding claim 22, Wilson in view of Yonge teaches the controller according to claim 16, and further Wilson teaches that the frame occupation signal generator is adapted to periodically transmit the frame occupation signal onto the media at the same point in time (Wilson teaches periodically transmitting signals at the same point in time that is an assigned time slot 21 in each frame 20 of figure 3).

36. Regarding claim 34, Wilson teaches a node connected to a media (stations A through K in figure 1), comprising: a media coupling circuit adapted to electrically interface the node to the media (TX/RX driver 4 of figure 2 adapted to electrically interface the station to media 2 and 2' of figure 1);

an application processor for executing an application program (DSP 7 in conjunction with memory 10as shown in figure 2);

a media access controller (bus switch 5 of figure 2) comprising:

a synchronization signal generator adapted to generate a synchronization signal and subsequently transmit the synchronization signal onto the media during a predetermined synchronization time slot (referring to figure 3, the Manchester encoder 6 inherently is a synchronization signal generator adapted to generate and subsequently transmit a start packet 19 during the predetermined first time slot 21 of each frame 20);

a synchronization mechanism adapted to achieve synchronization between a particular node and other nodes, the synchronization mechanism operative to control the generation of the synchronization signal by the synchronization signal generator (Wilson teaches a synchronization mechanism that uses the start packet to synchronize the stations of figure 1 throughout the summary of the invention);

a timing mechanism operative to produce a timing signal derived from a plurality of received synchronization signals (Wilson teaches deriving timing from the start packets which are used as a synchronization signals in lines 62-66 in column 1);

a transmit circuit adapted to receive a data stream from the media access controller for transmission onto the media (transmit portion of TX/RX driver 4 adapted to receive a data stream from bus switch 5 in figure 2); and

a receive circuit adapted to output a data stream received over the media to the media access controller (receive portion of TX/RX driver 4 adapted to output a data stream received over media 2 of figure 1 to bus switch 5 in figure 2).

However, Wilson fails to teach an occupation signal, or a MAC associated with the occupation signal.

Yonge teaches a frame occupation signal generator adapted to generate a frame occupation signal when the node obtains access to the media; and a media access controller for coordinating access to the media (MAC unit 18 as shown in figure 1 provides for contention-free media access and control as taught in 21-23 in column 11 where the access control includes a VSC mechanism that has a value is set to indicate that the media is busy as taught in lines 21-29 in column 19 and it is inherent that MAC unit 18 include a generator adapted to generate this VCS busy signal); and

a media access controller for coordinating access to the media MAC unit 18 of figure 1, that access to the media is not permitted as long as the presence of a frame occupation signal is detected on the media (if the VCS value is non-zero the medium is busy and the transmitter waits until value is zero of not busy, see lines 26-30 in column 27).). It would have been obvious to

one of ordinary skill in the art at the time the invention was made to modify Wilson's media access controller to add a busy signal as taught by Yonge. One would have been motivated to make this modification to extend the use of Wilson's controller beyond proprietary networks and allow its use on the widespread CSMA networks.

37. Regarding claim 35, Wilson teaches the controller according to claim 34, and further teaches that the timing mechanism is adapted to average the timing of a plurality of individual synchronization signals transmitted by other nodes (clock 7' which adjusts the station timing of the stations when it receives a start packet 19).

38. Regarding claim 36, Wilson teaches the controller according to claim 35, and further teaches that the averaging is achieved by time averaging the output of a matched filter adapted to the synchronization signal (referring to figure 2, the Manchester decoder in conjunction with the IFL receives and filters start packets that are used as synchronization signals and allows DSP 7 via interface bus 17 to recognize delays or early reception of start packets and adjust the clock rate as needed, see lines 51-54 in column 2).

39. Regarding claim 37, Wilson teaches the controller according to claim 34, and further teaches that the synchronization mechanism comprises processing means operative to:

listen to the media for a predetermined length of time while attempting to detect synchronization signals from other nodes (individual stations wait a certain time period to see if another start packet of a frame occurs where the time period corresponds to an integer multiple of the duration of a frame, see lines 18-22 in column 4, to detect a start packet that is employed by all stations as a synchronizing signal, see lines 62-66 in column 1);

if synchronization signals are detected, derive a timing signal from the synchronization signals (if the start packet is detected using this as the basis for the respective station clock and to derive timing for the respective station, see lines 60-66 in column 1);

align the clock in a particular node in accordance with the timing signal (synchronizing the individual stations with a fixed phase relationship via start packets that is synchronized anew with each transmission, see lines 14-20 in column 2, and adjusting the clock and clock pulse frequency based on the actual arrival time of a start packet, see lines 41-46 in column 2);

transmit synchronization signals into the media at specific points in time (transmitting the start packet with a specified repeat frequency, see lines 53-54 in column 1);

listening to the media when the synchronization signal is not transmitted and attempting to detect synchronization signals transmitted by other nodes (noticing an absence of a start packet, see lines 13-14 in column 4 and attempting to detect start packets from other stations see lines 5-44 in column 4); and

if synchronization signals are not detected, transmit synchronization pulses onto the media at particular points in time and waiting for other nodes to join the network (each station which notices that a frame is absent sends a start packet to the medium, see lines 23-25 in column 4 with a specified repeat frequency and waiting for other stations to accept it as the new master see lines 42-44 in column 4).

40. Regarding claim 38, Wilson in view of Yonge teaches the controller according to claim 34, and Wilson further teaches that the frame occupation signal generator is adapted to periodically transmit the frame occupation signal onto the media at the same point in time

(Wilson teaches periodically transmitting signals at the same point in time that is an assigned time slot 21 in each frame 20 of figure 3).

41. Regarding claim 39, Wilson teaches a network including a plurality of nodes (the network of figure 1 with stations A-K), a method of media access control for achieving coexistence of disparate nodes (media access control with start packets 19 and frames 20 of figure 3 for the medium 2 of figure 1 where stations of different intelligence may be established along the media in lines 21-23 in column 6), the method comprising the steps of:

allocating a synchronization time slot dedicated to the transmission of synchronization signals (allocating the first time slot 21 of frame 20 of figure 3 that is dedicated to the transmission a start pulse 19 in figure 1 that used as a synchronization signal, see lines 62-64 in column 1);

inserting a synchronization signal during the synchronization time slot (a node inserting a start packet with a specified repeat frequency, see lines 53-54 in column 1);

each node deriving timing from synchronization signals received from other nodes when that node is not transmitting the synchronization signal (each station receiving start packets and using this as the basis for the respective station clock and to derive timing for the respective station, see lines 60-66 in column 1);

Wilson teaches allocating a frame time slots dedicated to the transmission of frame signals; but fails to teach an occupation signal.

Yonge teaches a frame occupation signal (a VSC mechanism that has a value is set to indicate that the media is busy as taught in lines 21-29 in column 19);

each node listening for the presence of frame occupation signals to determine whether the media is available (detects if the media is busy by determining the value of the VCS in lines 26-30 in column 27); and

once a node detects the media is available, securing the media by transmitting the frame occupation signal (when the node detects a zero value for VCS the media is available and it updates the VCS value to secure the media, see lines 30-31 in column 27).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's media access controller to add a busy signal as taught by Yonge. One would have been motivated to make this modification to extend the use of Wilson's controller beyond proprietary networks and allow its use on the widespread CSMA networks.

42. Regarding claim 40, Wilson in view of Yonge teaches the method according to claim 39, and Wilson further teaches that portions of the plurality of nodes run different protocols (Wilson teaches a transmission protocol in line 39 in column 3 and teaches that the network may establish stations of different intelligence along the media, and it would be obvious to one of ordinary skill in the art that the difference intelligence could be different protocols).

43. Regarding claim 41, Wilson in view of Yonge teaches the method according to claim 39, and Wilson further teaches that portions of the plurality of nodes have different physical layers (Wilson teaches a physical layer for the TX/RX driver 4 of figure 2 that uses the frame of figure 3 and also teaches that the network may establish stations of different intelligence along the media, and it would be obvious to one of ordinary skill in the art that the difference intelligence could be different physical layers and frame structures).

44. Regarding claim 42, Wilson in view of Yonge teaches the method according to claim 39, but Wilson fails to teach that the synchronization signal comprises a sequence of single tone pulses, each pulse having a different frequency. Yonge teaches that the synchronization signal comprises a sequence of single tone pulses, each pulse having a different frequency (tone mask 252 as shown in figure 14 and disclosed in lines 62-67 in column 17 that is a set of different frequencies that are verified to be specific frequencies with the Valid Tone Flag 252 in lines 31-32 in column 16). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media and to segment the media with the different bi-phase sequences.

45. Regarding claim 43, Wilson in view of Yonge teaches the method according to claim 39, but Wilson fails to teach that the synchronization signal comprises a wide band bi-phase sequence. Yonge teaches that the synchronization signal comprises a wide band bi-phase sequence (the modulation type may be Binary Phase Shift Keying, see line 48 in column 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media with Binary Phase Shift Keying.

46. Regarding claim 44, Wilson in view of Yonge teaches the method according to claim 43, but Wilson fails to teach that the each node is adapted to transmit a different bi-phase sequence. Yonge teaches that the each node is adapted to transmit a different bi-phase sequence (each node has a local station tone mask 252, see lines 59-67 in column 17). It would have been obvious to

one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media and to segment the media with the different bi-phase sequences.

47. Regarding claim 45, Wilson in view of Yonge teaches the method according to claim 43, but Wilson fails to teach that the wide band bi-phase sequence is adapted to have good autocorrelation properties. Yonge teaches that the wide band bi-phase sequence is adapted to have good autocorrelation properties (a channel estimation process with 40 symbols for optimum modulation is discloses in line 58 in column 16 through line15 in column 17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method by adapting it to include tones as taught by Yonge, and one would have been motivated to make this modification in order to expand its use to include analog media to segment the media with the different bi-phase sequences while optimizing modulation.

48. Regarding claim 46, Examiner needs resolution of the 35 USC § 112 first and second paragraph issues cited above in order to interpret this claim and consider its merits.

49. Regarding claim 47, Wilson in view of Yonge teaches the method according to claim 46, but Wilson fails to teach a duty cycle of approximately 50%. The difference between the claimed invention and Wilson's method is that Wilson's media is a bus that uses digital pulses where the claimed invention uses analog tones for the digital information. Yonge teaches that the duty cycle is approximately 50% (Binary Phase Shift Keying with 1/2 rate coding in lines 48-49 in column 7).

50. Claim 7 rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson in view of De Lange et al. (U.S. 6,442,145), hereinafter referred to as De Lange. Wilson fails to teach that the step of aligning comprises providing a phase lock loop adapted to receive the timing signal and operative to maintain the clock in synchronization with the timing signal. De Lange teaches a digital PLL 60 in figure 6 and in line 60 in column 10 through line 37 in column 11. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Wilson's method of synchronization by adding the PLL as taught by De Lange. One would have been motivated to make this modification in order to better cope with noisy signals and achieve absolute synchronization.

Allowable Subject Matter

51. Claims 23-26, 28, 29, 32, and 33 allowed.

52. Claims 27 and 30 would be allowable if rewritten to overcome the rejection under 35 U.S.C. 112, first paragraph, set forth in this Office action in item 9 above.

53. Claim 31 is objected to as being dependent upon a rejected base claim 30, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

54. The following is an examiner's statement of reasons for allowance: Prior art teaches converging disparate synchronizations or adjusting clocks in a network such as the synchronization mechanism taught by Wilson that adjusts clocks on a single network, but prior art found to date does not teach converging clocks on a plurality of networks.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue

fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

55. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1) Markwalter et al. U.S. 6,577,630), Self-configuring source-aware bridging for noisy media.
2) Safadi (U.S. 5,572,517), Configurable hybrid medium access controller for cable metropolitan area networks.
3) Edem et al. (U.S. 5,586,117), Method and apparatus which allows devices with multiple protocol capabilities to converge to a common protocol configuration.
4) Bourgonje et al. (U.S. 4,672,606), Method, station and system for the transmission of messages in the form of data packets.
5) Wilson et al. (U.S. 5,107,490), Ring-type communication network.
6) Ilyadis et al. (U.S. 5,648, 959), Inter-module interconnect for simultaneous use with distributed LAN repeaters and stations.
7) Patel (U.S. 5,416,780), Telecommunications system and protocol for avoiding message collisions on a multiplexed communications link.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael I McLoughlin whose telephone number is 703-308-7911. The examiner can normally be reached on weekdays 7AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 703-305-4744. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mgm

February 6, 2004

HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600